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ABSTRACT

Data was gathered in conjunction with another study regarding the relationships between classroom interaction and constructive student attitudes. Using Flanders' categories, observations were made in two sections (the highest 20 percent and lowest 20 percent) of a departmentalized sixth grade. Each of four teachers (science, math, social studies, language arts) were observed with each section during 10 complete class sessions, five during the first and five during the last month of the semester. Data was entered onto a 10 x 10 matrix and interpretive techniques suggested by Flanders and by Soar were tested against results of the pupil affect as measured by a questionnaire administered at the end of the semester. Significant differences between teachers were obtained on Flanders' revised i/d ratio, on Soar's flexibility count, on the 7-7 (extended teacher criticism) and the 7-9 (teacher criticism followed by student initiation) cell frequencies, and on a number of other analytic combinations. The i/d ratio did not correlate with pupil affect as would be predicted--the highest i/d classroom did not have the most favorable affect nor the lowest the poorest affect. The flexibility count was most likely affected by achievement level of classroom in its relation to the emotional climate. Low achievers preferred low flexible interactions; high achievers seemed less affected by teacher flexibility. Combined 7-7 and 7-9 counts seems to be correlated with affect. (JS)

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Classroom Interaction and Pupil Affect

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Introduction:

Although the literature has rather consistently reported high achievement and constructive attitudes to be correlated in the classroom, recent student demonstrations should lead us to question the universality of such conclusions. Such demonstrations are often led by high-achieving students and against the educational establishment. If the high-achieving students, who have been accustomed to positive feedback from the educational establishment, are unhappy with the system, perhaps we should take another look at what transpires in the classroom with less assurance that we still know what kind of classroom interaction results in constructive attitudes. (Or perhaps we shall be forced to redefine constructive attitudes.)

This paper is based upon some side-effects data gathered by the author at the same time that data were gathered to test hypotheses concerning the relative effectiveness of the pupil-group, as opposed to the teacher, in changing the classroom interaction.

Procedure

Using the Flanders categories, observations were made by the author in a departmentalized sixth grade. Two of the five sections

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of sixth graders in the school were observed and a short questionnaire was administered to the pupils at the end of the semester (see appendix). Pupils had been assigned by the administration to the five sections of grade six on the basis of achievement test scores. (Tests had been given late in the spring while these pupils were in grade five.) The two sections observed were the 6-1 (highest 20%) and 6-5 (lowest 20%) of the total sixth grade population of this small town midwestern public school. Each section had approximately thirty pupils, nearly equally divided between boys and girls, and all Caucasian.

Four academic-area teachers were involved; each teacher teaching both sections of pupils daily. All four teachers were experienced and mature (over 30). The science and arithmetic teachers were male; the social studies and language arts teachers were female.

Each teacher was observed with each section of pupils during ten complete class sessions; five of such sessions were observed during the first month of the semester and the other five during the last month of the semester. Total observation time is shown in Table 1.

TABLE 1

Observation Time (in minutes)

	6 - 1 Section		6 - 5 Section	
SUBJECT AREA	ESO	LSO	ESO	LSO
Arithmetic	118	177	208	226
Science	178	191	262	230
Social Studies	210	234	136	163
Language Arts	200	187	229	243

ESO - Early semester observation LSO - Late semester observation

The Flanders observational data were entered onto a 10 X 10 matrix, and interpretive techniques suggested by Flanders (1966) and by Soar (1966) were tested against the results of the pupil affect as measured by the questionnaire.

Results and Discussion

Tables 2 and 3 summarize the results of the questionnaire. It can be seen from these tables that the language arts class elicited the most extreme responses. Of 516* possible top rankings (highest for all questions except #7 and #9; lowest for these two), language arts received only 72. Arithmetic received 112 top rankings; science received 228; and social studies, 104. Of 517 possible bottom rankings, language arts received 311, mathematics got 60, science got 74, and social studies got 72. It can be seen that the climate in the language arts classroom, as seen by the pupils, was the least desirable.

The questions numbered 4, 5, 7, 9, and 10 were written to assess the pupils' views as to whether the teacher was expanding or restricting the freedom of pupils. Coding the first and last choices for each teacher's classroom, a 2 X 4 analysis of variance was made using the five item scores as replications in each cell. Results are shown in Table 4 and graphed in Figure 1. Results indicated that there was a highly significant difference between teachers, and a significant interaction between section and teacher.

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* 52 pupils filled out questionnaires but two did not fill out all items completely, thus 516 total top ratings and 517 total bottom ratings instead of 520.

TABLE 2

Results of Student Questionnaire
First Choices of Pupils

Question	6 - 1 Section				6 - 5 Section				Interpretation of what a tally indicates
	Math	Science	S.S.	L.A.	Math	Science	S.S.	L.A.	
1	6	10	6	4	5	14	6	1	Favorite subject
2	1	1	4	20	7	9	3	7	Best pupil attention
3	3	2	10	11	7	11	3	5	Clearest assignments
4	11	10	3	2	5	15	4	2	Happiest
5	9	11	5	1	6	15	5	0	Most Freedom
6	5	8	6	7	2	17	5	1	Teacher best at answering questions
7	0	0	3	23	0	2	0	24	Strictest teacher
8	2	10	13	1	5	13	6	2	Pupils most often express own ideas
9	2	1	4	19	1	2	1	21	Teacher scolds most
10	4	13	5	4	5	16	2	2	Teacher praises most
Total	43	66	59	92	43	114	35	65	

Numbers in cells indicate the number of pupils whose first choice, in answering the question, was the subject at the column head.

TABLE 3

Results of Student Questionnaire
Last Choices of Pupils

Question	6 - 1 Section				6 - 5 Section				Interpretation of what a tally indicates
	Math	Science	S.S.	L.A.	Math	Science	S.S.	L.A.	
1	4	6	4	12	5	1	5	15	Most disliked subject
2	7	14	5	0	3	3	10	10	Least pupil attention
3	3	17	3	3	3	6	7	10	Least clear assignments
4	3	2	4	7	3	0	4	19	Unhappiest
5	1	2	2	21	2	0	3	21	Least freedom
6	8	8	2	8	1	0	5	19	Teacher poorest at answering questions
7	11	10	4	0	6	16	4	0	Teacher least strict
8	8	2	0	16	4	2	2	18	Pupils least often express own ideas
9	9	12	5	0	3	15	5	2	Teacher scolds least
10	2	3	6	15	0	3	2	20	Teacher praises least
Total	56	76	35	92	30	46	47	134	

Numbers in cells indicate the number of pupils whose last (fourth) choice in answering the question, was the subject at the column head.

Table 4

Summary of Analysis of Variance (2X4) of
Coded Scores Based on Pupil Questionnaire (items, 4, 5, 7, 9, and 10)

Source of Variation	SS	df	MS	F
Section (A)	.03	1	.03	N.S.
Teachers (B)	5208.68	3	1736.23	264.56**
A X B	94.27	3	31.42	4.79**
Within	210.00	32	6.56	
Total	5512.98	39		

** p.<.01

Figure 1 graphically illustrates the great difference between teachers and the especially low assessment of the language arts classroom.

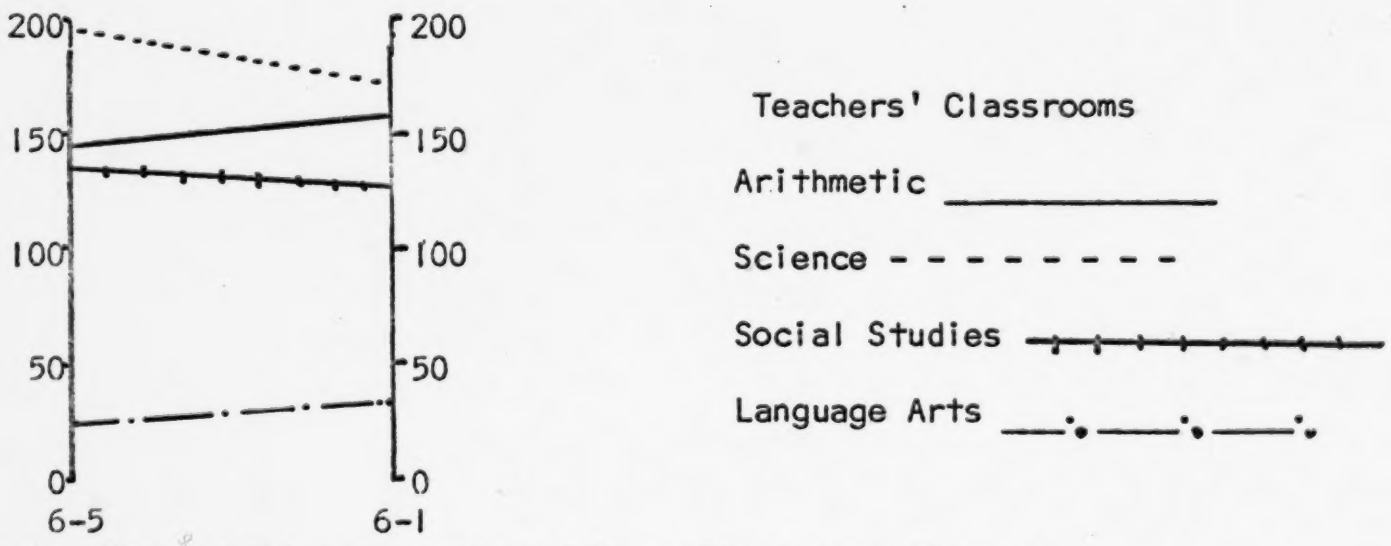

Figure 1. Mean coded scores of positive affect on pupil questionnaire

The interaction effect indicated that the arithmetic and language arts classrooms appeared more restrictive to the 6-5 section than to the 6-1 section, while the other two classrooms

seemed more restrictive to the 6-1 section than the 6-5 section. But the more pronounced results were the very significant ($p<.01$) differences between each pair of classrooms in the small sample (Table 5 Scheffé's Test).

Turning to the Flanders data, how did these same classrooms compare? A number of interpretive techniques were used with the data; only three will be reported. Using Flanders revised i/d ratio, the classrooms compared as shown in figure 2 which pictures the results of analysis of variance where differences were found ($p < .05$) among the classrooms.

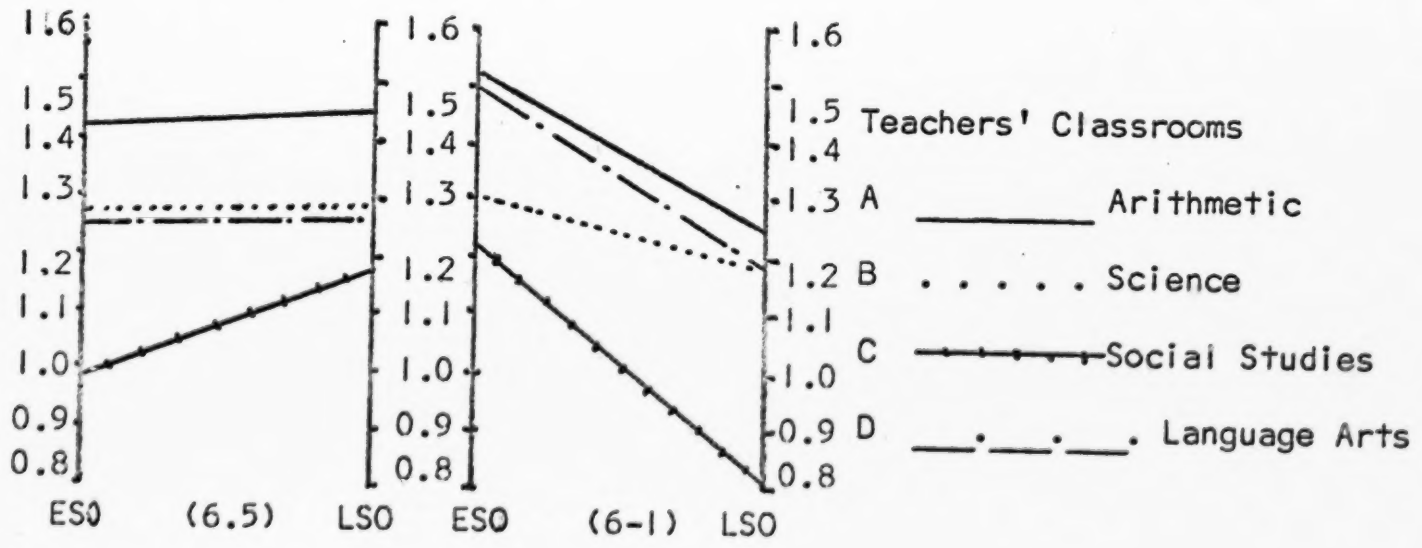

Figure 2 Transformed mean i/d ratios of the four teachers with each of the two pupil sections (6-5 and 6-1) for early (ESO) and late (LSO) semester observations.

TABLE 5

Scheffé's Test Using Coded Scores of Totals for Items 4, 5, 7, 9, and 10 on The Student Questionnaire

Mean	A	B	C	D	E	F	G	H					
	W5	WI	B5	BI	H5	Hi	S5	SI	$\sum a_l^a$	d_l	S_{d_f}	t_l	
	28.8	32.2	39.0	34.6	27.0	25.6	5.2	7.4					
A+BvC+D	I/2	I/2	-I/2	-I/2					I	- 6.3	1.15	-5.48	**
A+BvE+F	I/2	I/2			-I/2	-I/2			I	4.2	1.15	3.66	**
A+BvG+H	I/2	I/2					-I/2	-I/2	I	24.2	1.15	21.04	**
C+DvE+F			I/2	I/2	-I/2	-I/2			I	10.5	1.15	9.13	**
C+DvG+H			I/2	I/2			-I/2	-I/2	I	30.5	1.15	26.52	**
E+FvG+H					I/2	I/2	-I/2	-I/2	I	20.0	1.15	17.39	**

Critical t value t= 2.739 (P = .01)

A comparison of figures 1 and 2 graphically illustrates that while the language arts classroom has the poorest affective climate, it is the social studies classroom which is most direct (lowest i/d ratio). And even though the arithmetic teacher is the most indirect, it is the science teacher who has the best affective climate.

Turning to Soar's (1966) factor four, "Pupil freedom in discussion," and his first factor, "Teacher criticism," analyses of the Flanders data depended upon a flexibility score and upon the 7-7 and 7-9 cell counts. Analysis of variance based on the flexibility score yielded significant differences($p < .01$) between the two sections of pupils, between the various teachers' classrooms, and on the interaction between these two main effects. Figure 3 shows the results graphically.

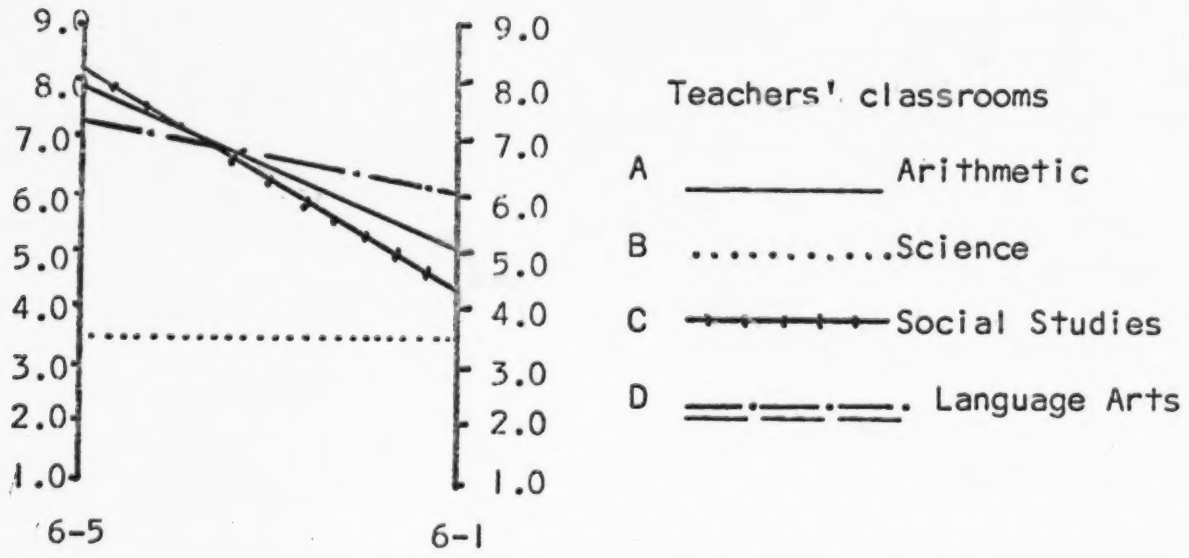

Figure 3. Interactions of teachers and sections on the flexibility count.

Here the science classroom is seen as the most inflexible, and this teacher was equally inflexible with the two sections of pupils. The other teachers showed a differential flexibility based on the section of pupils; all three teachers being much more flexible with the low-achieving (6-5) section. It is interesting to note that while three

ity with the lowachieving
s rated highest by that low-
stionnaire. It would seem
ent teacher behavior to flexible

pupil initiation following
(4-9, 10-9), pupil inter-
ing teacher indirect (1-9,
tly lower than the other
highest on most with teacher
If this factor does
ion, the objective evidence
ls are in almost complete
ow on all measures of this
m was seen by exactly
the classroom of most freedom.
the least free of the four class-
3 chose this classroom as the
their own ideas, while only
self-expression. On the other
high on Soar's fourth factor,
pupil self-expression by only
oom as least open. Obviously,
for self-expression as Soar

included the Flanders cells
7-9 (teacher criticism followed

by student initiation). Figures 4 and 5 show the results of analysis of variance based on these cells.

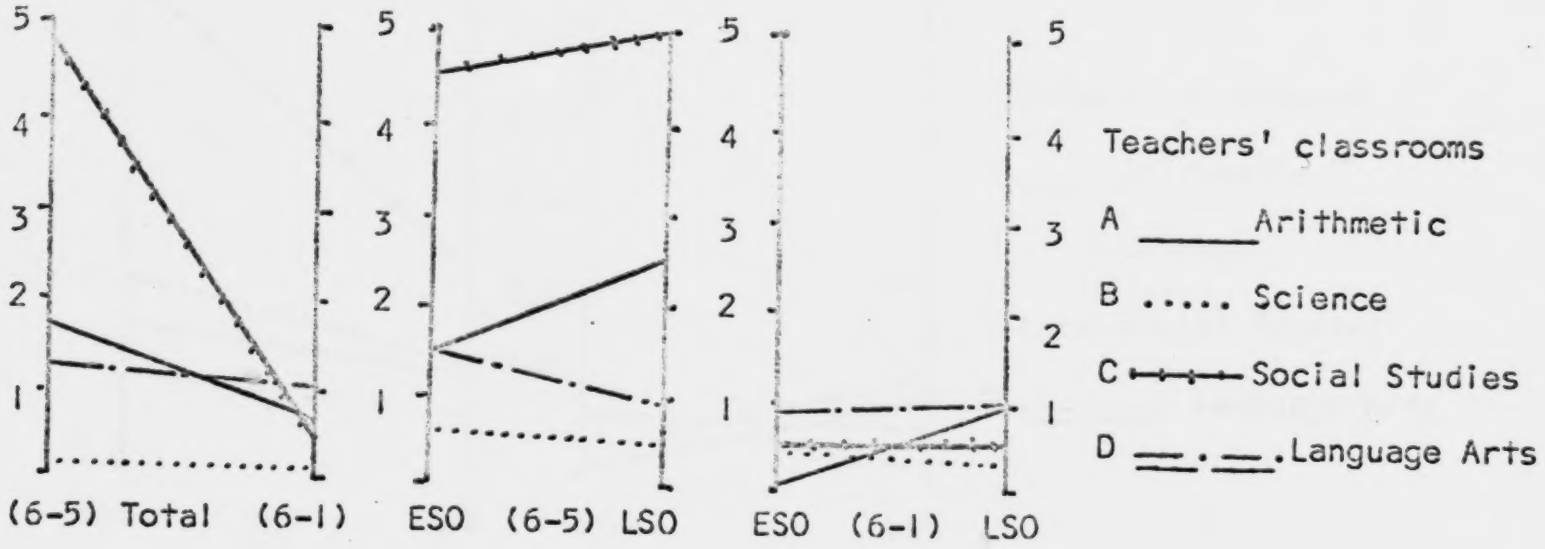

Figure 4. Interactions of teachers and sections across time (ESO and LSO) as tallied in the 7-9 cell.

The 6-5 section responded to teacher criticism by student initiation much more often than did the 6-1 section; this was especially true in the arithmetic and social studies classrooms. The figure points up that frequency in such 7-9 cells increased during the semester in both of these classrooms. It seems that the pupils did not see these two teachers as particularly threatening even though these teachers did use the 7 category rather frequently. But the frequency of 7-9 in the language arts classroom differed between the two sections; while 7-9 was becoming more frequent for the 6-1 section, it was becoming less frequent for the 6-5 section.

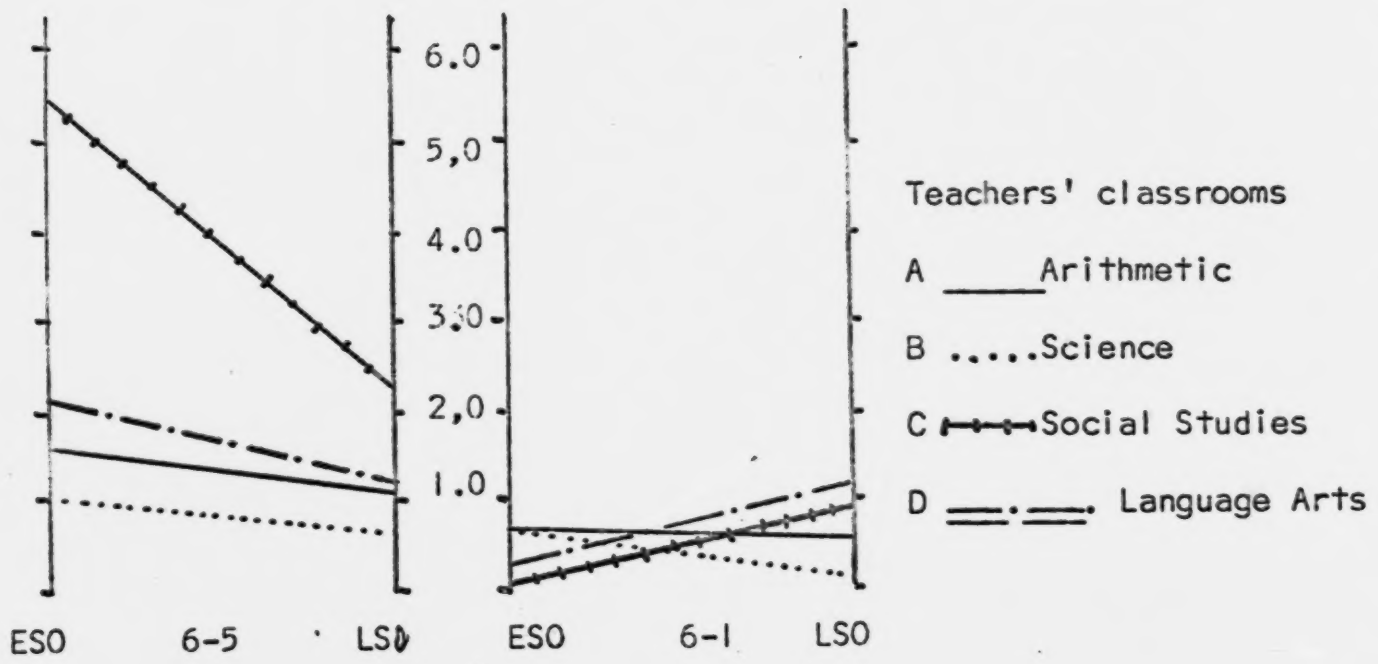

Figure 5. Use of 7-7 category showing interaction of teachers and sections of pupils across time (ESO to LSO).

Combining this observation with the data from the 7-7 cell, the picture becomes somewhat clearer. The pupils in section 6-5 were getting less extended teacher criticism (7-7) as the semester progresses; but in spite of fewer 7-7 entries, in two classrooms there was an increase of 7-9 entries. The 6-5 pupils were more often retorting to teacher criticism and yet were getting less criticism. This should not have been a particularly threatening or frustrating experience for the pupils. They should not have seen such classrooms as particularly stifling but should have felt relatively free. According to the questionnaire, this was probably the case.

It is true that they (6-5) reported feeling most free in the science classroom. The very low frequency of the use of category 7 in that classroom would justify such feeling. Children were scolded very rarely in that classroom.

The language arts classroom presented a different picture. According to the questionnaire, pupils (especially 6-5) felt restricted and unhappy in this classroom. The trend of extended teacher criticism (7-7) was downward in this room indicating that the teacher was scolding less, but the downward trend of 7-9 frequency in this classroom contrasts with its upward trend in arithmetic and social studies. These pupils (6-5) did not hesitate to answer teacher criticism in the other two classes, but they learned not to retort in the language arts class. The questionnaire probably reflected the pent-up frustrations in the language arts classroom.

The 6-1 section, on the other hand, was getting more criticism from the language arts teacher as the semester progressed, but this section was also increasing its answering to such criticism as reflected by increasing 7-9. The 6-1 pupilsdid not seem to be as threatened by this teacher and were thus not as critical of her classroom in their questionnaire responses.

Conclusions:

When adequate Flanders type samplings of classroom interactions are made, statistically significant differences between classrooms become apparent on various dimensions. A variety of interpretive techniques have been devised, and should be used in analysis of classrooms if adequate predictions and explanations of pupil attitudes are desired.

In the sample studied, significant differences between teachers' classrooms were obtained on Flanders' revised i/d ratio, on Soar's flexibility count, on the 7-7 and 7-9 cell frequencies, and on a number of other analytic combinations. The i/d ratio did not correlate with pupil affect as would be predicted -- the highest i/d classroom did not have the most favorable affect, and the lowest i/d classroom did not have the poorest affect. The relationship between i/d ratio and affect was not clear cut.

The flexibility count was most likely affected by achievement level of classroom in its relation to the emotional climate. Low achievers in this study preferred low flexible interactions, while high achievers seemed less affected by the teacher's flexibility.

The combined 7-7 and 7-9 counts seemed to be correlated with the affect, especially with a pent-up resentment against a teacher who somehow managed to lessen the 7-9 frequency as the semester progressed. Where that same teacher with a different pupil group did not lessen the frequency, the different pupil group saw this teacher's classroom in a more favorable light.

The data reported in this paper were gathered in conjunction with a study presented in a previous paper and were not specifically testing any hypotheses. They suggest certain further research specifically set up to test some of the apparent relationships observed.

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APPENDIX

Pupil Questionnaire

In all cases below, put 1 (one) in the blank before the subject which best answers the question. Put a 2 in the blank before your second choice; 3 before your third choice; and put a 4 in the blank before the subject which is your last choice.

____ arithmetic
____ science
____ social studies
____ language arts

1. Which is your favorite subject?

____ arithmetic
____ science
____ social studies
____ language arts

2. In which class do you pay attention the best?

____ arithmetic
____ science
____ social studies
____ language arts

3. In which subject are your assignments clearest?

____ arithmetic
____ science
____ social studies
____ language arts

4. In which class are you happiest?

____ arithmetic
____ science
____ social studies
____ language arts

5. In which class do you feel most free?

____ arithmetic
____ science
____ social studies
____ language arts

6. In which class does the teacher do the best job of answering your questions?

____ arithmetic
____ science
____ social studies
____ language arts

7. In which class is the teacher most strict?

____ arithmetic
____ science
____ social studies
____ language arts

8. In which class do you most often express your own ideas or feelings?

____ arithmetic'
____ science
____ social studies
____ language arts

9. In which class do children get scolded the most?

____ arithmetic
____ science
____ social studies
____ language arts

10. In which class do children get praised the most?